

S/N 10/660,206

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: WILD ET AL. Examiner: J. PARKIN  
Serial No.: 10/660,206 Group Art Unit: 1648  
Filed: SEPTEMBER 10, 2003 Docket No.: 11613.64USC1  
Title: METHODS OF ELICITING BROADLY NEUTRALIZING ANTIBODIES  
TARGETING HIV-1 GP41

CERTIFICATE UNDER 37 CFR 1.10:

"Express Mail" mailing label number: EV 372668146 US  
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By:

Name: Sheryl A. Boerboom

**SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT (37 C.F.R. § 1.97(b))**

Mail Stop MISSING PARTS

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Dear Sir:

With regard to the above-identified application, the items of information listed on the enclosed Form 1449 are brought to the attention of the Examiner.

This statement should be considered because it is submitted before the mailing date of a first Office Action on-the-merits. Accordingly, no fee is due for consideration of the items listed on the enclosed Form 1449.

In accordance with 37 C.F.R. § 1.98(a)(2) and § 1.98(d), copies have been provided only for those items listed on the enclosed Form 1449 that have not previously been cited by or submitted to the U.S. Patent and Trademark Office in parent application, U.S. Serial No. 09/480,336 filed on January 7, 2000.

No representation is made that a reference is "prior art" within the meaning of 35 U.S.C. §§ 102 and 103 and Applicants reserve the right, pursuant to 37 C.F.R. § 1.131 or otherwise, to establish that the reference(s) are not "prior art." Moreover, Applicants do not represent that a

reference has been thoroughly reviewed or that any relevance of any portion of a reference is intended.

Consideration of the items listed is respectfully requested. Pursuant to the provisions of M.P.E.P. 609, it is requested that the Examiner return a copy of the attached Form 1449, marked as being considered and initialed by the Examiner, to the undersigned with the next official communication.

Please charge any additional fees or credit any overpayment to Deposit Account No. 13-2725.

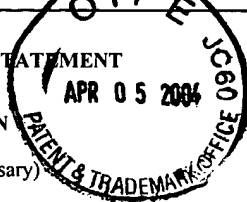
Respectfully submitted,

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U.S. PATENT DOCUMENTS						
EXAMINER INITIAL	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	5,464,933	11/07/1995	Bolognesi et al.			
	5,656,480	08/12/1997	Wild et al.			
FOREIGN PATENT DOCUMENTS						
	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION
						YES NO
	WO 00/40616	07/13/2000	PCT			
	WO 03/052122	06/26/2003	PCT			
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)						
		Barin, F. et al., "Virus Envelope Protein of HTLV-III Represents Major Target Antigen for Antibodies in AIDS Patients", <u>Science</u> , 1094-1096 (May 1985)				
		Brodeur et al., "Mouse-Human Myeloma Partners for the Production of Heterohybridomas", <u>Monoclonal Antibody Production Techniques and Applications</u> , Marcel Dekker, Inc., New York, 33:51-63 (1987)				
		Caffrey et al., "Three-dimensional solution structure of the 44 kDa ectodomain of SIV gp41", <u>EMBO J.</u> , 17(16):4572-4584 (August 17, 1998)				
		Caffrey et al., "Biophysical Characterization of gp41 Aggregates Suggests a Model for the Molecular Mechanism of HIV-associated Neurological Damage and Dementia", <u>J. Biol. Chem.</u> , 275(26):19877-19882 (June 30, 2000)				
		Calderone, T. et al., "High-level Misincorporation of Lysine for Arginine at AGA Codons in a Fusion Protein Expressed in <i>Escherichia coli</i> ", <u>J. Mol. Biol.</u> , 262:407-412 (Oct. 1996)				
		Cao, J. et al., "Effects of Amino Acid Changes in the Extracellular Domain of the Human Immunodeficiency Virus Type 1 gp41", <u>Journal of Virology</u> , 67(5):2747-2755 (May 1993)				
		Chan, D. et al., "Evidence that a prominent cavity in the coiled coil of HIV type 1 gp41 is an attractive drug target", <u>Proc. Natl. Acad. Sci. USA</u> , 95:15613-15617 (December 1998)				
		Chan et al., "Core Structure of gp41 from the HIV Envelope Glycoprotein", <u>Cell</u> , 89:263-273 (April 18, 1997)				
		Chan et al., "HIV Entry and Its Inhibition", <u>Cell</u> , 93:681-684 (May 29, 1998)				

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	Chen, C-H., et al., "A Molecular Clasp in the Human Immunodeficiency Virus (HIV) Type 1 TM Protein Determines the anti-HIV Activity of gp41 Derivatives: Implication for Viral Fusion", <u>J. Virol.</u> , 69:3771-3777 (June 1995)
	Clackson et al., "Making antibody fragments using phage display libraries", <u>Nature</u> , 352:624-628 (Aug. 15, 1991)
	Connor, R. et al., "Vpr is Required for Efficient Replication of Human Immunodeficiency Virus Type-1 in Mononuclear Phagocytes", <u>Virology</u> , 206:935-944 (1995)
	Cull, M.G., "Biotinylation of Proteins in Vivo and in Vitro Using Small Peptide Tags", <u>Methods Enzymol.</u> , 326:430-400 (2000)
	de Rosny, E. et al., "Peptides Corresponding to the Heptad Repeat Motifs in the Transmembrane Protein (gp41) of Human Immunodeficiency Virus Type 1 Elicit Antibodies to Receptor-Activated Conformations of the Envelope Glycoprotein", <u>Journal of Virology</u> , 75(18):8859-8863 (Sept. 2001)
	Doering, D. et al., "Cysteine Scanning Mutagenesis at 40 of 76 Positions in Villin Headpiece Maps the F-Actin Binding Site and Structural Features of the Domain", <u>Biochemistry</u> , 35:12677-12685 (1996)
	Dong, X. et al., "N- and C-domains of HIV-1 gp41: mutation, structure and functions", <u>Immunology Letters</u> , 75:215-220 (2001)
	Dwyer, J. et al., "The Hydrophobic Pocket Contributes to the Structural Stability of the N-Terminal Coiled Coil of HIV gp41 but Is Not Required for Six-Helix Bundle Formation", <u>Biochemistry</u> , 42:4945-4953 (2003)
	Earl, P. et al., "Epitope Map of Human Immunodeficiency Virus Type 1 gp41 Derived from 47 Monoclonal Antibodies Produced by Immunization with Oligomeric Envelope Protein", <u>J. Virol.</u> , 71:2674-2684 (April 1997)
	Furuta, R. et al., "Capture of an early fusion-active conformation of HIV-1 gp41", <u>Nature Structural Biology</u> , 5(4):276-279 (April 1998)
	Goding, <u>Monoclonal Antibodies: Principles and Practice</u> , Academic Press, 59-103 (1983)
	Golding et al., <u>Aids Res. Hum. Retroviruses</u> , 8:1607-1612 (1992)
	Golding, H. et al., "LFA-1 Adhesion Molecules Are Not Involved in the Early Stages of HIV-1 env-Mediated Cell Membrane Fusion", <u>Aids Research and Human Retroviruses</u> , 8(9):1593-1598 (Sept. 1992)
	Golding, H. et al., "Dissection of Human Immunodeficiency Virus Type 1 Entry with Neutralizing Antibodies to gp41 Fusion Intermediates", <u>Journal of Virology</u> , 76(13):6780-6790 (July 2002)
	He et al., "Peptides Trap the Human Immunodeficiency Virus Type 1 Envelope Glycoprotein Fusion Intermediate at Two Sites", <u>Journal of Virology</u> , 77(3):1666-1671 (Feb. 2003)

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		Holmes et al., "Bacteriophage Display of Chymotrypsin Inhibitor 2", <u>Protein Peptide Letters</u> , 3(6):415-422 (1996)
		Jiang, S. et al., "HIV-1 inhibition by a peptide", <u>Nature</u> , 365:113 (Sept. 9, 1993)
		Jiang, S. et al., "A Conformation-Specific Monoclonal Antibody Reacting with Fusion-Active gp41 from the Human Immunodeficiency Virus Type 1 Envelope Glycoprotein", <u>Journal of Virology</u> , 72(12):10213-10217 (Dec. 1998)
		Jiang, S. et al., "Peptide and Non-peptide HIV Fusion Inhibitors", <u>Current Pharmaceutical Design</u> , 8:563-580 (2002)
		Jonak, Z. et al., "A Human Lymphoid Recombinant Cell Line with Functional Human Immunodeficiency Virus Type 1 Envelope", <u>AIDS Research Human Retroviruses</u> , 9(1):23-32 (Jan. 1993)
		Kemble, G. et al., "Intermonomer Disulfide Bonds Impair the Fusion Activity of Influenza Virus Hemagglutinin", <u>J. Virol.</u> , 66:4940-4950 (Aug. 1992)
		Kilby, J. et al., "Potent suppression of HIV-1 replication in humans by T-20, a peptide inhibitor of gp41-mediated virus entry", <u>Nature Medicine</u> , 4(11):1302-1307 (Nov. 1998)
		Kohler, G. et al., "Continuous cultures of fused cells secreting antibody of predefined specificity", <u>Nature</u> , 256:495-497 (Aug. 7, 1975)
		Kozbor, D. et al., "A Human Hybrid Myeloma for Production of Human Monoclonal Antibodies", <u>Journal Immunology</u> , 133(6):3001-3005 (Dec. 1984)
		Laue, T. et al., "Analytical Ultracentrifugation in Biochemistry and Polymer Science", Harding, S.E., Rowe, A.J., and Horton, J. C., Eds., Royal Society for Chemistry, Cambridge, United Kingdom, pp. 90-125 (1992)
		Lottenberg, R. et al., "Assay of Coagulation Proteases Using Peptide Chromogenic and Fluorogenic Substrates", <u>Methods in Enzymology</u> , 80:341-361 (1981)
		Louis, J. et al., "Design and Properties of N <sub>CCG</sub> -gp41, a Chimeric gp41 Molecule with Nanomolar HIV Fusion Inhibitory Activity", <u>Journal of Biological Chemistry</u> , 276(31):29485-29489 (2001)
		Louis, J. et al., "Covalent Trimers of the Internal N-terminal Trimeric Coiled-coil of gp41 and Antibodies Directed against them are Potent Inhibitors of HIV Envelope-mediated Cell Fusion", <u>Journal of Biological Chemistry</u> , 278(22):20278-20285 (2003)
		Lu, M. et al., "A trimeric structural domain of the HIV-1 transmembrane glycoprotein", <u>Nature Struct. Biol.</u> , 2:1075-1082 (Dec. 1995)
		Lucic, M. et al., "Secretion in <i>Escherichia coli</i> and phage-display of recombinant insulin-like growth factor binding protein-2, <u>Australia Journal of Biotechnology</u> , 61:95-108 (1998)

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		Lusso, P. et al., "Growth of Macrophage-Tropic and Primary Human Immunodeficiency Virus Type 1 (HIV-1) Isolates in a Unique CD4 <sup>+</sup> T-Cell Clone (PM1): Failure to Downregulate CD4 and to Interfere with Cell-Line-Tropic HIV-1", <u>Journal of Virology</u> , 69(6):3712-3720 (June 1995)
		Marks, J. et al., "By-passing Immunization: Human Antibodies from V-gene Libraries Displayed on Phage", <u>J. Mol. Biol.</u> , 222(3):581-597 (Dec. 5, 1991)
		Mathews, D. et al., "Substrate Phage: Selection of Protease Substrates by Monovalent Phage Display", <u>Science</u> , 26:1113-1117 (1993)
		Micheal, N. et al., "In vitro and in vivo characterization of a recombinant carboxypeptidase G <sub>2</sub> ::anti-CEA scFv fusion protein", <u>Immunotechnology</u> , 2:47-57 (1996)
		Muster, T. et al., "A Conserved Neutralizing Epitope on gp41 of Human Immunodeficiency Virus Type 1", <u>J. Virol.</u> , 67:6642-6647 (Nov. 1993)
		Muster, T. et al., "Cross-Neutralizing Activity against Divergent Human Immunodeficiency Virus Type 1 isolates induced by the gp41 Sequence ELDK WAS", <u>J. Virol.</u> , 68:4031-4034 (June 1994)
		Root, M. et al., "Protein Design of an HIV-1 Entry Inhibitor", <u>Science</u> , 291:884-888 (Feb. 2, 2001)
		Sattentau, Q. et al., "Conformational Changes Induced in the Human Immunodeficiency Virus Envelope Glycoprotein by Soluble CD4 Binding", <u>J. Exp. Med.</u> , 174:407-415 (Aug. 1991)
		Sattentau, T. et al., "Human Immunodeficiency Virus Type 1 Neutralization is Determined by Epitope Exposure on the gp120 Oligomer", <u>J. Exp. Med.</u> , 182:185-196 (July 1995)
		Studier, F. et al., "Use of T7 RNA Polymerase to Direct Expression of Cloned Genes" <u>Methods in Enzymology</u> , 185:60-89 (1990)
		Tan, K. et al., "Atomic structure of a thermostable subdomain of HIV-1 gp41", <u>Proc. Natl. Acad. Sci. USA</u> , 94:12303-12308 (Nov. 1997)
		Tracy, P. et al., "Platelet Factor Xa Receptor", <u>Methods in Enzymology</u> , 215:329-360 (1992)
		VanCott, T. et al., "Antibodies with Specificity to Native gp120 and Neutralization Activity against Primary Human Immunodeficiency Virus Type 1 isolates Elicited by Immunization with Oligomeric gp160", <u>J. Virol.</u> , 71:4319-4330 (June 1997)
		Weiss, C. et al., "Studies of HIV-1 envelope glycoprotein-mediated fusion using a simple fluorescence assay", <u>AIDS</u> , 10:241-246 (1996)
		Weissenhorn, W. et al., "Atomic structure of the ectodomain from HIV-1 gp41", <u>Nature</u> , 387:426-430 (May 1997)

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		Weng, Y. et al., "Mutational Analysis of Residues in the Coiled-Coil Domain of Human Immunodeficiency Virus Type 1 Transmembrane Protein gp41", <u>Journal of Virology</u> , 72(12):9676-9682 (Dec. 1998)
		White, J. et al., "Anti-Peptide Antibodies Detect Steps in a Protein Conformational Change: Low-pH Activation of the Influenza Virus Hemagglutinin", <u>J. Cell Biol.</u> , 105:2887-1896 (Dec. 1987)
		Wild, C. et al., "A Synthetic Peptide from HIV-1 gp41 is a Potent Inhibitor of Virus-Mediated Cell-Cell Fusion", <u>AIDS Res. Hum. Retroviruses</u> , 9:1051-1053 (Nov. 1993)
		Wild, C. et al., "The Inhibitory Activity of an HIV Type 1 Peptide Correlates with its Ability to Interact with a Leucine Zipper Structure", <u>AIDS Res. Hum. Retroviruses</u> , 11:323-325 (March 1995)
		Wild, C. et al., "A synthetic peptide inhibitor of human immunodeficiency virus replication: Correlation between solution structure and viral inhibition", <u>Proc. Natl. Acad. Sci. USA</u> , 89:10537-10541 (Nov. 1992)
		Wild, C. et al., "Peptides corresponding to a predictive $\alpha$ -helical domain of human immunodeficiency virus type 1 gp41 are potent inhibitors of virus infection", <u>Proc. Natl. Acad. Sci. USA</u> , 91:9770-9774 (Oct. 1994)
		Wild, C. et al., "Propensity for a leucine zipper-like domain of human immunodeficiency virus type 1 gp41 to form oligomers correlates with a role in virus-induced fusion rather than assembly of the glycoprotein complex", <u>Proc. Natl. Acad. Sci. USA</u> , 91:12676-12680 (Dec. 1994)
		Wild, C. et al., "A synthetic peptide inhibitor of human immunodeficiency virus replication: Correlation between solution structure and viral inhibition", <u>Proc. Natl. Acad. Sci. USA</u> , 89:10537-10541 (Nov. 1992)
		Wingfield, P. et al., "The extracellular domain of immunodeficiency virus gp41 protein: Expression in <i>Escherichia coli</i> , purification, and crystallization", <u>Protein Science</u> , 6:1653-1660 (1997)
		Wung, J. et al., "Selection of phage-displayed superantigen by binding to cell-surface MHC class II", <u>Journal of Immunological Methods</u> , 204(1):33-41 (1997)
		Xu, J-Y et al., "Epitope Mapping of Two Domains of gp41, the Transmembrane Protein of Human Immunodeficiency Virus Type 1, Using Ten Human Monoclonal Antibodies", <u>J. Virol.</u> , 65:4832-4838 (Sept. 1991)
		Copy of International Search Report mailed June 6, 2000

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